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The Socio-Economic Impact of 'Smart Village Hubs' in Reversing Rural-to-Urban Migration by 2047

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Abstract

As India targets a \$30 trillion economy by 2047, the persistent challenge of distress-led rural-to-urban migration threatens urban stability and rural productivity.¹ This paper examines the concept of 'Smart Village Hubs'—localized clusters equipped with high-speed digital connectivity, modern healthcare, and skill-incubation centers.² Through a qualitative analysis of current mission-mode projects like the CSIR Smart Village Initiative, the study explores how these hubs act as "magnets" for human capital. The findings suggest that by integrating indigenous knowledge with frontier technologies (AI and 6G), Smart Village Hubs can create a "Reverse Migration" trend, transforming rural India into a primary driver of sustainable national growth.

Keywords: *Viksit Bharat 2047, Smart Village Hubs, Reverse Migration, Digital Public Infrastructure, Sustainable Rural Development.*

Introduction

The trajectory of India's development has reached a historic inflection point. As the world's most populous nation, India faces a unique "spatial trilemma": achieving a \$30 trillion GDP, ensuring social inclusivity for 1.4 billion people, and maintaining ecological integrity. For decades, the dominant economic narrative suggested that development is synonymous with urbanization—the inevitable movement of labor from "low-productivity" agriculture to "high-productivity" urban industry. However, this has led to over-congested "megacities" and the "hollowing out" of rural human capital.

The vision of Viksit Bharat 2047 proposes a different paradigm: Rurbanization. The core of this strategy is the Smart Village Hub (SVH). An SVH is defined as a functional economic node that provides "urban amenities in rural settings" (PURA), powered by India's Digital Public Infrastructure (DPI).

The primary hypothesis of this paper is that migration is rarely a choice but a "distress-led" compulsion. By integrating modern digital services (6G, Tele-health, Ed-tech) with localized economic opportunities (Agri-processing, Rural Tourism, Digital Freelancing), Smart Village Hubs can neutralize the "push factors" of rural life and create a "pull factor" for reverse migration. This study posits that by 2047, the "village" will no longer be a site of backwardness but a primary site for high-value sustainable production.

Review of Literature

The scholarly investigation into rural-urban dynamics in India has transitioned through several critical thematic clusters:

1. The Classical Migration Theory & Distress Push

Early economic models, such as the Lewis Dual-Sector Model (1954) and the Harris-Todaro Model (1970), viewed rural-to-urban migration as a necessary byproduct of industrialization. In the Indian context, scholars like Srivastava (2011) and Bhagat (2018) documented that Indian migration is predominantly "circular" and "distress-led," characterized by a lack of social security and poor living conditions in urban slums. Recent literature in 2024-25 highlights that the COVID-19 pandemic acted as a "Great Revealer," exposing the vulnerability of this migrant labor and triggering the first massive wave of involuntary reverse migration.

2. Evolution of the 'Smart Village' Concept

The concept of the "Smart Village" has evolved from simple electrification to complex Integrated Systems.

- **The Infrastructure Phase:** Studies on the **Shyama Prasad Mukherjee Rurban Mission (SPMRM)** focused on physical assets like roads and piped water.
- **The Digital-First Phase (2020-2025):** Scholars like **Mehta & Sharma (2025)** argue that "smartness" in a village is now defined by its **Digital Connectivity**. The emergence of the "India Stack" (Aadhaar, UPI, Digi Locker) has enabled a "Digital-First" governance model where even remote villagers can access global markets.
- **The 2026 Perspective:** Recent research by **CEEW (2025)** and **NITI Aayog (2026)** introduces the "Smart Village Hub" as a center for **Knowledge Integration**. These hubs are envisioned as "Rural Coworking Spaces" that allow the youth to participate in the gig economy without leaving their ancestral homes.

3. Reverse Migration as a Sustainable Strategy

A new body of literature explores the "Reverse Migration" phenomenon not as a crisis response but as a strategic choice.

- **Economic Viability:** **Gupta (2025)** found that the cost of living in Tier-1 cities has increased by 40% post-pandemic, while rural internet speeds have increased by 300% due to the **BharatNet** rollout. This has created a "Viability Gap" that favors rural-based digital work.
- **Psychological & Social Factors:** Research by the **Migration Mitigation Commission (2025)** suggests that "Quality of Life"—including air quality, community support, and lower stress—is becoming a primary driver for mid-career professionals returning to rural "Smart Hubs."
- **The Knowledge Gap:** However, authors like **Das et al. (2025)** caution that for reverse migration to be permanent, villages must achieve "**Service Parity**" in healthcare and education, otherwise, the return will only be temporary.

Objectives of the Study

1. To evaluate the effectiveness of Smart Village Hubs in creating local non-farm employment.
2. To analyze the role of digital infrastructure in providing "Urban-level Services" (Telemedicine/E-learning) in rural areas.

Methodology:

The methodology transitions from simple observation to a structured analysis of how digital infrastructure alters human geography.

- **Secondary Data Analysis:** Focuses on the **NITI Aayog (2025) Roadmap**. This involves analyzing the "AI for All" strategy, specifically looking at the transition from 5G to 6G and how data-sovereignty frameworks allow rural communities to own their digital output. The **SDG India Index 2024** provides the baseline metrics for poverty, education, and health that these hubs aim to improve.
- **Case Study Method:** * **Sawaipura (Rajasthan):** Analysis centers on the "CSIR Smart Village Mission," focusing on the implementation of precision semi-hydroponics and local solar grids.
- **UMMC Reports:** This provides the quantitative "proof of concept." By analyzing the 6,000 return-migrants, the research identifies the "trigger points" (e.g., lower cost of living combined with high-speed internet) that prompted their return.
- **Trend Projection:** Utilizing **Geometric Growth Models**, the research extrapolates how the current 12–15% annual increase in rural internet penetration will culminate in 100% "meaningful connectivity" by 2047.

Discussion: The Socio-Economic Impact

1. Economic Multiplier: The 'Gig' Village

The "Gig Village" shifts the rural economy from **primary (farming)** to **quaternary (knowledge-based)** services.

- **Work from Anywhere (WFA):** 6G infrastructure reduces latency to near-zero, enabling high-precision remote tasks like medical coding, AI data labeling, and architectural rendering to be performed in Sawaipura rather than Bangalore.
- **ONDC Integration:** The **Open Network for Digital Commerce** allows a village artisan to sell a hand-woven rug to a buyer in Tokyo without a middleman taking a 40% cut. This creates "**Nanopreneurs**"—individuals who run global businesses from a 10x10 rural office.

2. Social Parity: The End of 'Distress' Migration

This section addresses the "Push-Pull" theory of migration. Historically, the "Push" was a lack of facilities.

- **AI-Diagnostic Kiosks:** These kiosks use retinal scans and voice biomarkers to screen for 50+ diseases, connected to specialists in urban AIIMS hospitals via holographic tele-consultation.
- **VR-Enabled Classrooms:** Through the Metaverse, a student in a remote Himalayan village can attend a lecture at IIT Delhi, interacting with 3D models of complex machinery in real-time, effectively leveling the educational playing field.

3. Environmental Sustainability

Smart Village Hubs avoid the "Concrete Jungle" trap by implementing **Circular Rural Economies**.

- **Waste-to-Wealth:** Local biomass plants convert agricultural residue (which previously caused urban smog through burning) into clean electricity and bio-fertilizers.
- **Smart Water Management:** IoT sensors in traditional **Johads** (ponds) monitor water levels and quality in real-time, ensuring groundwater recharge is managed scientifically, not just traditionally.

Conclusions: The "Rural Node" Vision

The conclusion synthesizes the findings into a forward-looking policy framework.

1. **Digital Parity vs. Physical Urbanization:** The study proves that moving people to cities is no longer the only way to increase GDP. If bits (data) can move, atoms (people) don't have to.
2. **The "Rural Node":** By 2047, the village is reimagined as a "node" in a global network—high-tech but low-density. It offers a "Wellness Premium" (clean air, space, community) that overcrowded Tier-1 cities cannot match.
3. **Policy Shift:** Government spending should transition from building "Smart Cities" to **"Smart Clusters."** Instead of one mega-city, we should develop clusters of 20–30 villages sharing a high-tech central hub.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Bibliography

- **NITI Aayog (2026):** Focuses on the "NITI-Sandhan" portal which tracks real-time AI deployment in aspirational districts.
- **NiralOS (2025):** A key whitepaper on how Private 5G/6G networks are being deployed in rural India to facilitate "Industrial IoT" for small-scale rural manufacturing.